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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/812,015	03/30/2004	Seung Wan Chae	2336-255	2799

7590 03/10/2006

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EXAMINER

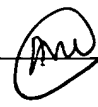
VU, HUNG K

ART UNIT	PAPER NUMBER
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2811

DATE MAILED: 03/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/812,015	CHAE, SEUNG WAN	
	Examiner	Art Unit	
	Hung Vu	2811	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 December 2005.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-13 and 33-39 is/are pending in the application.
- 4a) Of the above claim(s) 13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 33-39 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 7 – 10 and 38 – 39 are rejected under 35 U.S.C. 102(a) as being anticipated by Hata et al. (PN 6,649,942).

Hata et al. discloses, as shown in Figure 1-14, a GaN-based semiconductor light emitting diode comprising:

a substrate (1) on which a GaN-based semiconductor material is grown;

a lower clad layer (4) formed on the substrate, and made of a first conductive GaN semiconductor material (n-type);

an active layer (5) formed on a designated portion of the lower clad layer, and made of an undoped GaN semiconductor material;

an upper clad layer (7) formed on the active layer, and made of a second conductive GaN semiconductor material (p-type);

an alloy layer (10a) formed on the upper clad layer, and made of a hydrogen-storing alloy [Col. 25, lines 46-67];

wherein the alloy layer has a thickness of 20Å (within the range of 10 Å to 100 Å) [Col. 6, lines 52-53].

Regarding claim 8, Hata et al. discloses the diode further comprising a first metal layer (10b) formed on the alloy layer, and made of a one metal selected from the group consisting of Au, Pt, Ir and Ta [Col. 6, lines 53-55].

Regarding claim 9, Hata et al. discloses the first metal layer has a thickness of 100 Å or less [Col. 6, lines 53-55].

Regarding claim 10, Hata et al. discloses the first metal layer has a thickness the same as or larger than that of the alloy layer.

Regarding claim 38, Hata et al. discloses the diode further comprising:

- a metal layer (10b) on an upper surface of the alloy layer;
- an electrode layer (11) on an upper surface of the metal layer;
- wherein the electrode layer occupies only a middle region of the upper surface of the metal layer without covering a peripheral region of the upper surface of the metal layer, the peripheral region surrounding the middle region.

Regarding claim 39, Hata et al. discloses each of the alloy layer and the metal layer has a meshed structure [Figures 2, 7-9, and 11].

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 – 6, 11, 12 and 33 – 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hata et al. (PN 6,649,942).

Hata et al. discloses, as shown in Figure 1-14, a GaN-based semiconductor light emitting diode comprising:

- a substrate (1) on which a GaN-based semiconductor material is grown;
- a lower clad layer (4) formed on the substrate, and made of a first conductive GaN semiconductor material (n-type);
- an active layer (5) formed on a designated portion of the lower clad layer, and made of an undoped GaN semiconductor material;
- an upper clad layer (7) formed on the active layer, and made of a second conductive GaN semiconductor material (p-type);
- an alloy layer (10a) covered substantially the entire upper surface of the upper clad layer, and made of a hydrogen-storing alloy [Col. 25, lines 46-67].

Hata et al. does not disclose the alloy layer on the entire upper surface of the upper clad layer. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the alloy layer of Hata et al. covering the entire upper surface of the clad layer in order to further improve the ohmic contact of the electrode.

Regarding claim 2, Hata et al. discloses the alloy layer is made of one hydrogen-storing alloy selected from the group consisting of Mn-based hydrogen-storing alloys, Ln-based hydrogen-storing alloys, Ni-based hydrogen-storing alloys and Mg-based hydrogen-storing alloys [Col. 25, lines 46-67].

Regarding claim 3, Hata et al. discloses the Mn-based hydrogen-storing alloy is MnNiFe or MnNi [Col. 25, lines 46-67].

Regarding claim 4, Hata et al. discloses the La-based hydrogen-storing alloy is LaNi<sub>5</sub> [Col. 25, lines 46-67].

Regarding claim 5, Hata et al. discloses the Ni-based hydrogen-storing alloy is ZnNi or MgNi [Col. 25, lines 46-67].

Regarding claims 6, 11, 34 and 34, Hata et al. discloses all of the claimed limitations except material of the alloy layer or the second metal layer. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the device of Hata et al. having the materials as that claimed by Applicant, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

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Regarding claim 12, Hata et al. discloses a second metal layer (11) has a thickness of 500 Å to 10,000 Å [Col. 6, lines 59-63].

Regarding claim 33, Hata et al. discloses the alloy layer has a thickness of 20Å (within the range of 10 Å to 100 Å) [Col. 6, lines 52-53].

Regarding claim 35, Hata et al. discloses each of the alloy layer and the metal layer has a meshed structure [Figures 2, 7-9, and 11].

Regarding claim 36, Hata et al. discloses the diode further comprising:

- a metal layer (10b) on an upper surface of the alloy layer;
- an electrode layer (11) on an upper surface of the metal layer;
- wherein the electrode layer occupies only a middle region of the upper surface of the metal layer without covering a peripheral region of the upper surface of the metal layer, the peripheral region surrounding the middle region.

### ***Response to Arguments***

3. Applicant's arguments with respect to claims 1 and 7 have been considered but are moot in view of the new ground(s) of rejection.

*Conclusion*

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Vu whose telephone number is (571) 272-1666. The examiner can normally be reached on Tuesday to Friday 6:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on (571) 272 - 1732. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Vu

March 1, 2006



Hung Vu

Primary Examiner